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Editorial

Editorial: Learning and training in safety and health

1. Introduction

This special issue is based on papers originally presented at the 2014 Working on Safety conference held in Scotland, supplemented by 2 papers on aspects of the topic which were submitted in the normal paper flow to the journal over the period from October 2014 to the end of that year. It is a particular pleasure for me to be guest editor for this issue, as the evaluation of the effect and effectiveness of safety training has been a constant concern in my career (e.g. Hale, 1984). This special issue contributes a little more to the knowledge of the area, although only one paper (Von Thiele Schwarz et al., 2016) reports direct evaluation of the effectiveness of a piece of training. The rest contribute in descriptive ways to our understanding of the broad topic of learning and training.

The topic is a very broad and disparate one, as the 10 papers witness. Four papers deal with the training of individuals to play their part more competently in the management of safety[1] at work, 3 dealing with the competency and capability of safety professionals whose full-time task it is to advise on how to manage safety (Pryor, 2016; Paul and Pearse, 2016; Wybo and van Wassenhove, 2016) and one dealing with the effects of training in the different styles of leadership on safety (Von Thiele Schwarz et al., 2016). The remaining 6 papers deal with the organisation as the learning entity, modifying its safety management system (SMS) or culture. 2 of these papers looked at learning from incidents/accidents (Jørgensen, 2016; Pilbeam et al., 2016); two papers looked at learning and change in response to regulations on safety culture (Bye et al., 2016; Kongsvik et al., 2016); and one each looked at the link between learning and design (Gotcheva et al., 2016) and the effect of different levels of proactivity in the SMS on measures of safety and productivity (Haslam et al., 2016).

2. Individual training

The papers on individual learning take us into the world of the Human Resources manager within companies and of the training providers and the certifiers of individuals (safety professionals [SP]) and the courses (here focussing on university level courses, either graduate or post-graduate) that train them and equip them with their competence and capability to practice.

The development of certifiable training requires the completion of a number of steps. Firstly the specification of the roles and tasks to be fulfilled by the SPs, secondly the definition of the knowledge, skills and attitudes required to perform the tasks competently, thirdly the translation of this into learning objectives for the design of training courses and related guided experience to turn the knowledge and skills into practice, and finally the structuring of this competence into a coherent discipline with an underlying body of knowledge (BoK).

2.1. Safety Practitioners (SPs)

The importance of training of SPs is emphasised by numbers quoted in passing in Pryor's paper – 650 SPs in training in any one year in Australia, and in Wybo and van Wassenhove's paper – 97 postgraduate courses operating in France. It is clear from the three papers on the SP that the four steps outlined above are not always clearly distinguished, or divided up in the same way.

Pryor's paper (2016) focusses on the Australian BoK, a series of chapters setting out the theoretical basis of the SP's capability which is being used as one of the criteria for the accreditation of university courses. She emphasises that this is not a competency framework and indicates that it is simply a template onto which the universities must map their courses to see if they cover the vast majority of the theoretical basis. She also shows how the development of such a BoK triggers learning and change in the universities running the course, as they are given a clear benchmark against which to set their own offerings. The BoK is, however, only one of many other criteria for accreditation, the remainder of which relate broadly to the transparency and completeness of the processes of teaching, administering and examining the courses.

Paul and Pearse's paper (2016) takes up the issue of benchmarking and rates the Australian SP BoK against three competency frameworks, two of related disciplines (ergonomics and public health) and one more distantly related discipline of software engineering. It is written as a discussion paper and has been reviewed as such. Hence its tone and content are more controversial and combative, coming up as it does with a relatively unfavourable rating of the Australian SP BoK against the other frameworks. Safety Science therefore invites researchers and other experts to respond, either in full papers or letters to the journal, to the discussion issues raised by Paul and Pearse. Issues include;

[1] 'Safety' is used throughout this editorial to mean all aspects of safety and health at work, sometimes called 'occupational health and safety (OHS)'.

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- Is the benchmarking comparing like with like?
- Are the process criteria used for the benchmarking appropriate and fair? Are they good proxies for the real issues we want to compare?
- Are the ratings for each framework fairly allocated?
- How does the relative development of the 4 disciplines into coherent theoretical structures impact on the comparisons?
- Is the use of the Queensland course alone as benchmark for the content of the BoK appropriate?
- How could the BoK be improved taking account of the benchmarking critique?

Wybo and van Wassenhove's paper (2016) uses the published safety literature on the role and training of SPs as the basis for a definition of the role and tasks of the SP. This represents step one of the four set out above. The knowledge and skills defined seem to match well to the content of the BoK and the work of bodies such as ENSHPO (European Network of Safety & Health Professional Organisations (EUSafe, see website; Hale et al., 2005) and INSHPO (International Network of Safety & Health Practitioner Organisations (Pryor et al., 2015; Hale et al., 2015) in defining the knowledge, skills and attitudes needed by SPs. All of these sources emphasise the need of the SP for the 'soft' skills of collaborating, coordinating, controlling, communicating and convincing, and stress the need for the SP to work under pressure and from positions of relative structural powerlessness.

2.2. Leadership

Von Thiele Schwarz et al. (2016) focus on the most important collaborators whom the SPs have in their role of advisers on safety management and organisational learning, namely the senior managers. One important aspect of the role and tasks of such managers (step one in my earlier 4 steps of individual training) is their leadership style. Her paper studies the effect of training in a transformational leadership style, coupled with applied behavioural analysis, on the balance to be struck between the often conflicting demands of safety and productivity. The course is claimed to be a novel combination of the skills needed to inspire performance through transformational leadership and to provide the goal setting, monitoring and feedback needed specifically to control risk. This is an interesting combination of inspiration, which encourages proactivity, and control, which emphasises correction and reactivity, but then with a positive note of support rather than criticism. The outcome measures are changes in safety climate scores and self-ratings of transformational leadership efficacy and of productivity. These are partly managers' own self-ratings and partly employee perceptions.

The study also looked at whether the transformational leadership had to have a specific focus on safety or whether it was just as effective, or even more so, when focussed on leadership in general, related as much to improvements in productivity as to safety. The results are overwhelmingly positive, with improvements of perceived safety climate coupled with no reduction in employee perceptions of productivity. The results also showed that the most effective training was focussed on general leadership and not specifically on safety outcomes.

3. Learning organisations

The remaining papers deal with different aspects of organisational learning. That process consists of the steps of:

(1) picking up signals from which can be learned and reporting them,
(2) their analysis, either by individuals or in a group/team setting,
(3) taking action (or not) as a response to the analysis, which Argyris & Schön (1978) classify as either single-loop (correction back to a previously agreed safe state) or double-loop (modifying the situation, procedures, resources, or actions to create a less risky state than before).

The triggers may be incidents or accidents, hazards found present or violations of procedures/rules or non-conformities found in audits (Jørgensen, 2016; Pilbeam et al., 2016; Anderson and Kodate, 2015) All of those occur at the workplace or in processes and the learning may need to take place immediately in operations, or in long term feedback to design of replacement processes or technology. Triggers at organisational level may be new regulations like the regulations on safety culture in Norwegian oil and gas legislation (Bye et al., 2016; Kongsvik et al., 2016).

Pilbeam et al. report an analysis of the use of audio recorders and a diary method to both report and analyse and take action in service industries. Jørgensen proposes the use of 'Infocards' issued to supervisors to pick up gaps in risk control provision or operation/effectiveness. Several of the papers use as their outcome measure the changes proposed based on the analyses and whether those are single- or double-loop.

Gotcheva et al. (2016) look at the difficulties of learning in a design phase of a nuclear facility, due to the distributed nature of design and the long time cycle from design to operations. Finally Haslam et al. (2016) study a sample of companies assessed on a safety management and culture maturity scale, at whose highest level sit proactive and learning organisations, and assess the quality of their safety climate and their safety and productivity performance.

3.1. Learning from incidents, accidents and other non-conformities

Jørgensen (2016) points to the relative neglect of, and poor quality of learning from what she calls 'simple accidents', the low consequence, high probability occurrences contrasted with fatalities and disasters. The latter get exhaustive attention in most developed countries, but the former are too often dismissed as inevitable, the fault of the victim and not worth analysis. She adopts the approach developed in the WORM and ORCA projects in the Netherlands and Denmark (Bellamy et al., 2006; Jørgensen, 2008), which has developed bowties for all simple accidents, identifying the barriers which should be in place and the management delivery systems that should ensure that they are present and function effectively and proposes that generic lists of information about these barriers and delivery systems should be provided on 'infocards' to supervisors to trigger their detection and analysis, at least in single-loop learning, if not also in double-loop.

Pilbeam et al. (2016) find the value of the rich data provided by audio diaries as a basis for SP's analysis of a range of hazards, incidents or violations. They reduce hindsight bias and encourage reporting in situations where underreporting is widespread.

3.2. Learning from regulation change

The two papers by Bye et al. (2016) and Kongsvik et al. (2016) are complementary. They both deal with a Norwegian learning opportunity and process triggered by the introduction in the petro-